What is claimed is:

1. A composition of matter comprising: a biomolecule in combination with a metal particle, wherein said metal particle and said biomolecule are positioned at a distance apart sufficient to adjust intrinsic emission of electromagnetic radiation from the biomolecule in response to an amount of exciting electromagnetic radiation.

2. The composition of claim 1, wherein the biomolecule comprises a nucleic acid.

3. The composition of claim 1, wherein the biomolecule comprises a purine or pyrimidine.

4. The composition of claim 1, wherein the biomolecule comprises a nucleoside or nucleotide.

5. The composition of claim 1, wherein the biomolecule comprises an oligonucleotide.

6. The composition of claim 1, wherein the biomolecule comprises a protein.

7. The composition of claim 1, wherein the biomolecule comprises an amino acid.

8. The composition of claim 1, wherein the biomolecule comprises a lipid.

9. The composition of claim 1, wherein the biomolecule comprises a sugar moiety.

10. The composition of claim 1, wherein the metal particle is at a distance of about 50 Å to about 2000 Å from the biomolecule.

11. The composition of claim 1, wherein the metal particle comprises a noble metal.

12. The composition of claim 11, wherein the noble metal is selected from the group consisting of rhenium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, and gold.

13. The composition of claim 1, wherein the metal particle is sub-wavelength in size.

14. The composition of claim 1, wherein the biomolecule is linked to the metal particle.

15. A method for increasing the intrinsic fluorescence of a biomolecule, said method comprising the step of:

positioning a metal particle and said biomolecule at a distance apart sufficient to increase the electromagnetic emission from said biomolecule in response to an amount of exciting radiation.

16. A method for detecting a biomolecule, said method comprising the steps of:

(a) positioning a metal particle and a biomolecule at a distance apart sufficient to manipulate the electromagnetic emission from said biomolecule;

(b) exposing said biomolecule to an amount of exciting radiation; and

(c) detecting the electromagnetic emission from said biomolecule.

17. A method for manipulating fluorescence intensity of a biomolecule, said method comprising the steps of:

(a) increasing the rate of radiative decay of the biomolecule by positioning the biomolecule adjacent to a metal particle; and

(b) exposing the biomolecule to an amount of exciting radiation.

18. A method for detecting the presence of a nucleic acid sequence in a sample, said method comprising the steps of:

(a) providing a sample;

(b) adding a nucleic acid sequence linked to a metal particle;

(c) exposing the sample to an amount of exciting radiation;

(d) detecting the fluorescence; and

(e) determining the presence of the nucleic acid sequence based on the detection of the fluorescence.

19. A method for increasing the fluorescence intensity of a fluorescently labeled biomolecule, said method comprising the steps of:

(a) labeling a biomolecule with a fluorophore;

(b) positioning the labeled biomolecule next to a metallic particle such that in response to an amount of exciting radiation, the fluorophore emits radiation.

20. A method for increasing fluorescence energy transfer on a fluorescently labeled biomolecule, said method comprising the steps of:

(a) labeling a biomolecule with a donor fluorophore and an acceptor fluorophore;

(b) positioning the labeled biomolecule adjacent to a metal particle such that in response to an amount of exciting radiation, the donor fluorophore transfers energy to the acceptor fluorophore causing the acceptor fluorophore to emit electromagnetic radiation.

21. A method for increasing fluorescent intensity of a fluorophore, said method comprising the steps of:

(a) positioning a fluorophore adjacent to a metal particle; and

(b) exciting said fluorophore with a plurality of photons.

22. A method for increasing fluorescent intensity of a biomolecule, said method comprising the steps of:

(a) positioning a biomolecule adjacent to a metal particle; and

(b) exciting said biomolecule with a plurality of photons.

23. A method for selectively enhancing the region of electromagnetic emission of a sample, said method comprising the steps of:

(a) directing a metal particle to a region of interest in the sample; and

(b) providing an amount of exciting radiation in the region of interest.

24. A method for selectively enhancing the region of electromagnetic emission of a sample, said method comprising the steps of:

(a) directing a metal particle to a region of interest in the sample;

(b) contacting the sample with a fluorophore;

(c) exposing the sample to an amount of exciting radiation.

25. A method for increasing fluorescence energy transfer on a fluorescently labeled biomolecule, said method comprising the steps of:

(a) labeling a first biomolecule with a donor fluorophore

(b) labeling a second biomolecule with an acceptor fluorophore;

(c) positioning the labeled biomolecules adjacent to a metal particle such that in response to an amount of exciting radiation, the donor fluorophore transfers energy to the acceptor fluorophore increasing the emission of electromagnetic radiation of the acceptor fluorophore.

26. A microarray system comprising:

a solid support, wherein the solid support is coated with metal particles; and

a matrix having an array of biomolecules attached to the support such that when a labeled probe hybridizes to the biomolecules, the fluorescence of the labeled probe increases in response to an amount of exciting radiation.

27. A composition of matter comprising: a biomolecule in combination with a metal surface, wherein said metal surface and said biomolecule are positioned at a distance apart sufficient to adjust intrinsic emission of electromagnetic radiation from the biomolecule in response to an amount of exciting electromagnetic radiation.